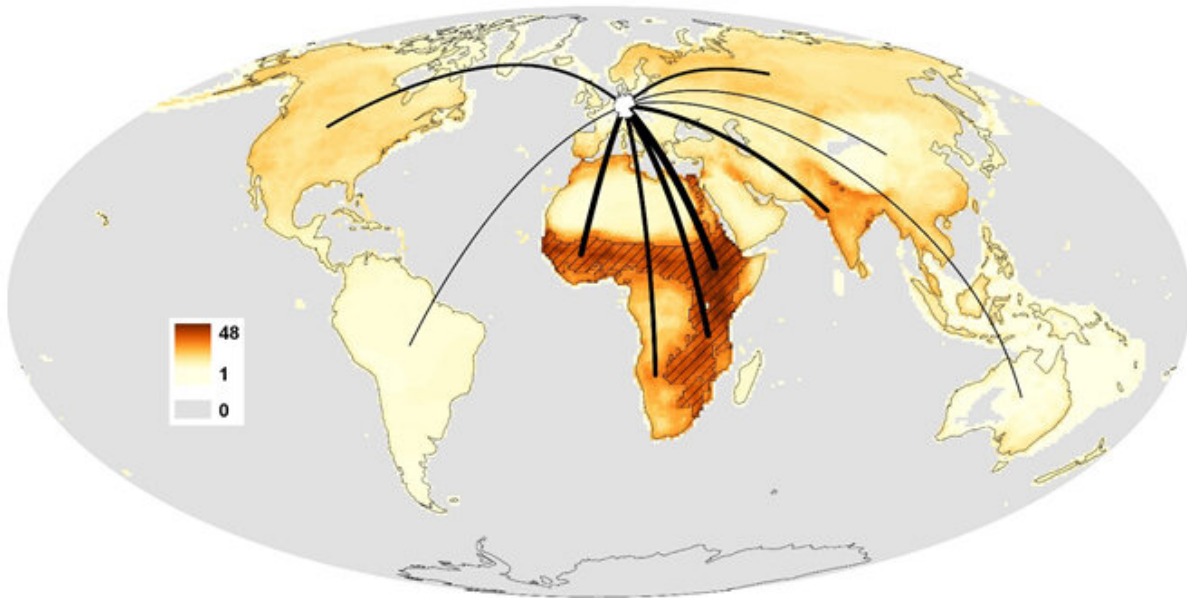


The wellbeing connection

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Map of the regions that are home to species with existence value for Germany. The colour scale represents the number of species that occur in parallel in a given location (maximum value for Germany 48, grey represents 0). Shaded areas represent hotspots (the most species-rich 2% of the Earth's surface). Curved black lines show the flows of existence value from regions that provide ecosystem services to Germany (line thickness corresponds to number of species at the point of origin in the region). Credit: Original publication DOI: [10.1007/s13280-019-01261-3](https://doi.org/10.1007/s13280-019-01261-3)

Soya and beef from South America, timber from Russia, fish from

China—in an era of globalisation, central Europe has become a market for animal and plant products from all over the world. But in addition to these tangible goods, faraway ecosystems also supply intangible or cultural services that do not appear in any trade balance sheet. For example, they provide habitats for species whose existence is of interest to many Europeans.

But what kind of regions provide such cultural ecosystem services for highly developed and densely populated countries in Europe?

Together with colleagues in the Netherlands, researchers at the Helmholtz Centre for Environmental Research (UFZ) in Leipzig investigated this question. Their findings reveal that Germany and the Netherlands benefit predominantly from services in particularly threatened ecosystems in very poor regions of the world. Responsibility for protecting these ecosystems must therefore be more fairly distributed, argue the researchers in the journal *Ambio*.

Large, charismatic birds like the black stork and the common crane are extremely popular in Germany, and not just among ornithologists. Every year, hordes of people head outdoors with binoculars to watch the cranes' migration. In some parts of the country, this event has even become a significant tourist attraction. But in many cases, for people in central Europe to enjoy natural phenomena like these, the conditions elsewhere need to be right. A number of popular bird species migrate, crossing the Mediterranean by different routes to spend the winter in Africa.

"If the climate or land uses change in the African winter quarters, this can have obvious effects here in Germany," says environmental scientist Dr. Matthias Schröter. The effects may be both ecological and psychological. The smaller the number of birds that return in the spring, the less effectively they can fulfill their role in local ecosystems—and

the fewer opportunities there are for wildlife lovers in central Europe to experience pleasure, relaxation or inspiration from encounters with these animals.

Experts refer to such close interconnections between humans and ecosystems in faraway regions as 'telecoupling.' So far, research into how these relationships function and what consequences they have for the supplier at one end of the world at the consumer at the other has mostly focused on agricultural and forestry products. "There are also a couple of studies on industrialised countries that use forests in other regions as carbon sinks to improve their carbon footprint," says Schröter. Some researchers have also studied migrating species that function as pest controllers or pollinators in far-apart regions.

But when it comes to intangible ecosystem services, the situation is more difficult. The effect that nature has on human wellbeing is hard to quantify and analyse numerically. Accordingly, little is currently known about this form of telecoupling. For example, which other regions of the world do people in Germany depend on to be able to enjoy wildlife? And how can we go about demonstrating the link? "There have only been a very few studies so far, and they focus on individual species," says Schröter. "For example, they looked at the links created by the giant panda between its native habitats in China and zoos all over the world."

But he and his colleagues wanted to take a broader look at the phenomenon by including as many animal species as possible. Firstly they analysed data from two online platforms on which German and Dutch bird lovers can post their sightings. They narrowed the data down to the 300 most frequently mentioned species and examined the ranges of these species.

People in Germany and the Netherlands also have a weakness for more exotic species that they may never encounter themselves. Many people in

central Europe couldn't imagine a world without lions, elephants, pandas or great apes, even if they experience no direct benefit from these animals. "Charismatic species like these have value to many people simply through the fact that they exist," says Schröter. So to identify these valued species, he and his colleagues combed through 40 annual reports from major conservation organisations such as Naturschutzbund Deutschland (NABU) and the Dutch branch of WWF. "We worked on the assumption that the species mentioned here are particularly popular and have high societal relevance," the UFZ scientist explains.

In this way, the team identified 108 birds and 22 mammals that enjoy celebrity status in Germany. The top five places were taken by the common crane, the white-tailed eagle, the osprey, the northern lapwing and the black stork, with the tiger, the first mammal, following in sixth place. In the Netherlands, meanwhile, the African elephant topped the list. "Almost half of the popular animals among German conservation organisations spend at least part of their lives in distant countries," says Schröter. For the species important to German birdwatchers, the figure is nearly 60%.

Next the researchers overlaid the ranges of all these treasured animals, allowing them to identify the regions that are home to particularly large numbers of the [species](#) and whose ecosystems therefore provide the widest range of services for the two countries in question. For Germany, the hotspots are mainly in the African savannah and scrubland south of the Sahara. In the Netherlands, an important role is also played by forests and grasslands closer to home in eastern Europe and central Asia.

"When you take a closer look at these regions, you notice two trends," Schröter explains. Firstly, these are habitats that are heavily influenced by humans, only a small portion of which are protected. For example, less than five percent of the hotspots of value to Germany are located in national parks or other reserves with similarly strict regulations.

Moreover, these are also especially poor regions. In the regions important to Germany, the average annual income is just 1,424 US dollars per capita.

"For one thing, we can use findings like these to support more effective and better coordinated conservation efforts," says Schröter. "But it also raises questions of justice." Are poorer countries adequately compensated for ecosystem services that benefit richer ones? In the researcher's opinion, this is not the case. The cost burden of setting up protected areas should not be borne only by the countries that provide the ecosystem services and a few international conservation organisations: "Countries whose citizens benefit from these services far away should also make a financial contribution." To create more justice, he adds, such contributions could, for example, be integrated into the targets of the international Convention on Biological Diversity.

More information: Matthias Schröter et al, Distant regions underpin interregional flows of cultural ecosystem services provided by birds and mammals, *Ambio* (2019). [DOI: 10.1007/s13280-019-01261-3](https://doi.org/10.1007/s13280-019-01261-3)

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